

Docket No. SC-01-05

### REMARKS

The Examiner is thanked for his/her careful and very thorough Office Action, and for allowance of claims 1-5, 15, and 19.

Claim 6 is hereby amended to correct the alleged informalities identified by Examiner. These changes are not believed to add new matter, and entry is respectfully requested. Claim 6 (and its dependents, namely claims 7-9) are now believed in condition for allowance, and favorable reconsideration is respectfully requested.

The specification is hereby amended to correct the alleged informalities identified by Examiner. Namely, brief descriptions of figures 61 and 62 have been added, as indicated above. These changes are not believed to add new matter, and entry is respectfully requested.

All other rejections are respectfully traversed, for the reasons outlined below.

#### 35 USC 112 second paragraph rejection of claims 6-9

Claims 6-9 were rejected under 35 USC 112, second paragraph, as being indefinite. Claim 6 has been amended (as shown) to read:

6. (currently amended) A downhole assembly which indicates a failure condition, comprising:

a valve capable of by irreversible movement of a valve which affects mud flow impedance from a first state which is initially present during normal drilling ~~irreversibly~~ into at least one intermediate state having reduced mud flow impedance which indicates a failure condition, and thereafter irreversibly into a final state, which returns mud flow impedance to substantially that seen during normal drilling.

This claim now claims a downhole assembly, comprising a valve with the specified functionality.

Since claim 6 is not rejected over any cited references, claim 6 and dependent claims 7-9 are now believed in condition for allowance, and favorable reconsideration is respectfully requested.

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**35 USC 103 rejection of claims 10-13**

Claims 10-11 were rejected under 35 USC 103 as obvious over Scherbatskoy in view of McCullough.

For purposes of discussion, claim 10 is reproduced:

10. A method of operating a drill rig, comprising the steps of:  
monitoring downhole mud flow impedance;  
halting drilling when said impedance is altered by a downhole valve which opens or closes a shunt path for mud flow;  
wherein said valve changes position according to readings of one or more sensors located on a downhole sub assembly.

Scherbatskoy appears to teach a system in which downhole conditions are signaled to the surface using mud flow shockwaves. For example, Scherbatskoy states at col. 1, lines 30-35:

This invention generally pertains to measurements while drilling a bore hole in the earth and more particularly pertains to systems, apparatus, and methods utilizing hydraulic shock waves in the drilling mud column for transmission of signals representing one or more downhole parameters to the earth's surface.

Scherbatskoy teaches a sensor (101) that measures a downhole parameter. The sensor controls a valve (40) such that the valve opens and closes to generate a signal that can be detected at the surface. The signal represents the data gathered by the sensor. Hence, changes in mud flow represent sensor data, and the changes in mud flow are used to transmit data as gathered by the sensor. For example, column 8, lines 19-25 state:

The electronic processing assembly 96 generates a coded sequence of electric pulses representative of the parameter being measured by a selected sensor 101, and corresponding openings and closings of the valve 40 are produced with the consequent corresponding pressure pulses at the standpipe 24.

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Examiner states in the rejection that, "Scherbatskoy does not disclose halting drilling when the impedance is altered." Examiner seeks to cure this deficiency by citing McCullough for the proposition that when a problem is encountered during drilling, drilling is halted.

However, Applicant respectfully submits that this combination does not teach or suggest the limitations of claim 10, and that the proposed combination is improper.

Specifically, Applicant respectfully submits that making the combination suggested by the Examiner would render Scherbatskoy inoperable.

The stated purpose of Scherbatskoy, and the examples presented and cited by Examiner, teach that mud flow impedance is an information carrying medium, which carries signals from a sensor to the surface by varying mud flow through movement of a valve, the valve being controlled essentially by the sensor readings. Changes in the mud flow represent changes in a downhole parameter as measured by a downhole sensor.

If Scherbatskoy were to be modified in the way Examiner suggests, i.e., to halt drilling when the mud flow impedance is altered, then no data could be transmitted to the surface, which would defeat the purpose of Scherbatskoy's invention and render it inoperable. Transmitting data to the surface is the stated purpose of Scherbatskoy, and its examples teach that the mud flow must be modified repeatedly, and that "corresponding openings and closings of the valve 40 are produced with the consequent corresponding pressure pulses at the standpipe 24.... The signal representative of these pressure changes is processed by electronic assembly 53, which generates signals suitable for recording...."

Hence, Examiner's proposed combination would render the invention of Scherbatskoy inoperable because if changes in mud flow impedance caused drilling to halt, then Scherbatskoy could not accomplish its stated objective of transmitting sensor readings to the surface via changes in mud flow impedance. Because the proposed combination would render the cited

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reference inoperable, Applicant respectfully submits that the proposed combination is improper. The MPEP states at section 2145:

“However, the claimed combination cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose.”

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In the present case, the modification proposed by the Examiner--namely, halting drilling upon change of mud flow impedance--would render the Scherbatskoy reference inoperable, because Scherbatskoy uses continual changes in mud flow over a period of time in order to transmit complex data readings from a downhole sensor to the surface. If the Examiner's proposed combination were made, then the resulting device from Scherbatskoy would no longer function for its intended purpose. Hence, Applicant respectfully submits that the proposed combination is improper.

Further, even if the proposed combination were to be made, it would not teach all the limitations of claim 10. Neither Scherbatskoy nor McCullough teaches the claimed limitation of

“halting drilling when said impedance is altered”

as claimed in claim 10. Scherbatskoy only teaches that mud flow is altered to relay sensor data to the surface. McCullough only teaches (according to Examiner's argument) that drilling is halted when a problem is encountered. Neither reference, nor their combination, teaches the above-cited limitation in claim 10.

Therefore, at least claim 10 is believed distinguished from the cited references. Favorable reconsideration is respectfully requested. Further, because of their dependency on an allowable claim, dependent claims 11-13 are also hereby believed distinguished from the cited references. Favorable reconsideration is respectfully requested.

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**Conclusion**

Thus, all grounds of rejection and/or objection are traversed or accommodated, and favorable reconsideration and allowance are respectfully requested. The Examiner is requested to telephone the undersigned attorney or Robert Groover for an interview to resolve any remaining issues.

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Respectfully submitted,



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